

Overview

Simplify and make your data center change-ready. The HP 1/10Gb Virtual Connect Ethernet Module for the c-Class BladeSystem is the simplest, most flexible connection to your networks. The Virtual Connect Ethernet Module is a new class of blade interconnect that simplifies server connections by cleanly separating the server enclosure from LAN, simplifies networks by reducing cables without adding switches to manage, and allows you to change servers in just minutes, not days. The HP 1/10Gb Virtual Connect Module for c-Class BladeSystem is an innovative, new class of integrated interconnects from HP.

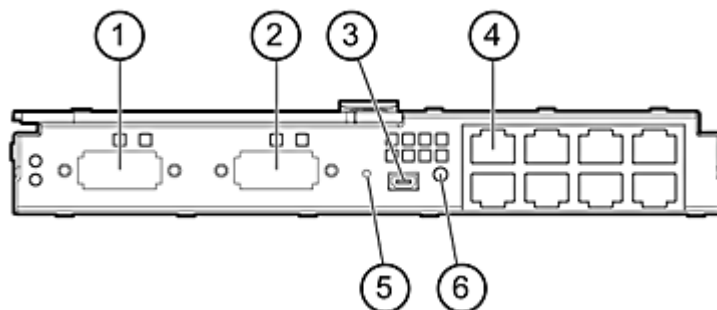


Figure 1 Virtual Connect Ethernet Module Front Bezel

- | | |
|--|----------------------------------|
| 1. X1 10GBASE-CX4 port | 4. Ports 1-8 (10/100/1000BASE-T) |
| 2. X2 10GBASE-CX4 port | 5. Reset button (recessed) |
| 3. USB 2.0 connector (covered, for future use) | 6. Next button |

What's New

- Support for HP BladeSystem c3000 Enclosure
- Stacking with the HP 1/10Gb-F Virtual Connect Ethernet Module
- Enhanced with new enterprise level LAN management tools, Virtual Connect can be administered via SNMP and a scriptable Command Line Interface. LAN traffic can also be monitored with common network analysis tools assuring maximum uptime and performance.

Models

HP 1/10Gb Virtual Connect Ethernet Module for c-Class BladeSystem

399593-B22

At A Glance

Performance

- (2) 10GBASE-CX4 uplinks can be connected to core switches or used to stack Virtual Connect modules
- (8) 10/100/1000BASE-T uplinks can be connected to core switches or used to stack Virtual Connect modules
- Wire speed performance on all ports
- IGMP Snooping optimizes network traffic and reduces bandwidth for multicast applications such as streaming applications
- VLAN Tagging, Pass-Thru and Link Aggregation supported on all uplinks

Management

- Virtual Connect Manager is included with every module
- HTTP and a secure, scriptable CLI interface is ready out of the box. Easy setup and management via the Onboard Administrator interface
- SNMP v.1 and v.2, provide ease of administration and maintenance.

Overview

- Role-based security for network and server administration with LDAP compatibility
- Port Mirroring on any uplink provides network troubleshooting support with Network Analyzers
- Appears as a Pass-Thru device to the LAN Manager

Virtual Connect Server Profiles

- Allows setup of server connectivity prior to server installation for easy deployment
- Ability to move, add, or change server network connections on the fly
- Once defined, LAN and SAN administrators don't have to be involved in server changes

Options

- Stack multiple Virtual Connect Ethernet modules together in an enclosure to allow any server Ethernet port to connect to any uplink
- The Fibre Channel Virtual Connect Module provides a complete LAN and SAN Virtual Connect solution
- HP CX-4 Ethernet cables are available in .5m, 1m, 3m, and 15m lengths
- Supports all Server NIC's including LOM and Mezzanine card options

Supported Products

Compatibility

HP ProLiant Servers

All HP ProLiant BladeSystem c-Class Server Blades with latest ROM updates
Supports all Server NIC's including LOM and Mezzanine card options

Virtual Connect requires the following minimum firmware levels:

- BL460c BIOS - System ROM version 2007.05.01 or later
- BL480c BIOS-System ROM version 2007.05.01 or later
- BL465c BIOS - System ROM version 2007.04.05 or later
- BL685c BIOS - System ROM version 2007.04.05 or later

Server Mezzanine Cards:

- QLogic QMH2462 4Gb FC HBA QLogic Firmware loaded when driver is loaded. Use QLogic BIOS version 1.26 (in Multiboot 1.63) or later
- HP Emulex LPe 1105-HP 4Gb FC BIOS version 6.00a2 (3.00a4) or later

For the latest additional information on required firmware versions and to download firmware upgrades, see the HP website <http://www.hp.com/go/bladeupdates>.

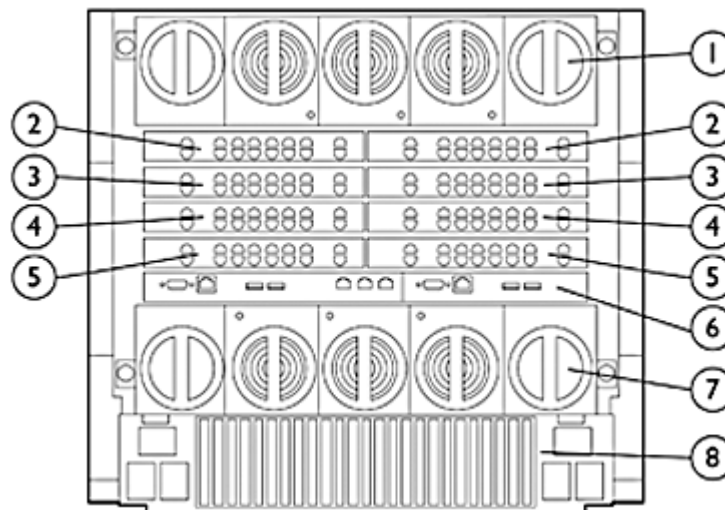
ProLiant BL c-Class Server Blade Enclosures

The HP BladeSystem c3000 and c7000 Enclosures have been designed up front with the Virtual Connect Architecture in mind incorporating the HP Onboard Administrator, ILO Management, and HP Management tools inside the Virtual Connect framework.

Virtual Connect requires the following minimum firmware levels:

- Single and redundant Onboard Administrators - (version 2.01 or later)

Supported Configurations



HP BladeSystem c7000 Enclosure - Rear View

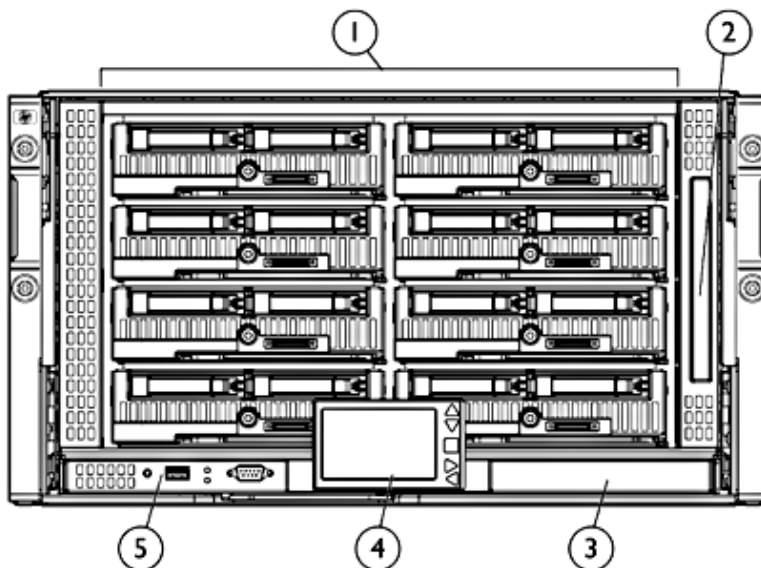
1. Upper Fan System
2. Interconnect Bays 1 / 2
3. Interconnect Bays 3 / 4

5. Interconnect Bays 7 / 8
6. On Board Administrator
7. Lower Fan System

Supported Products

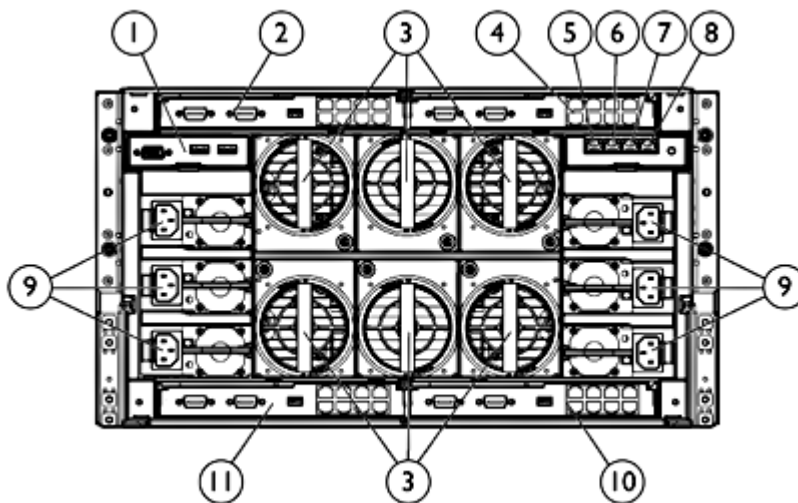
4. Interconnect Bays 5 / 6

8. Rear Redundant Power Complex



HP BladeSystem c3000 Enclosure - Front View

- | | |
|--|---------------------------------|
| 1. Device Bays 1 thru 8 | 4. Insight Display |
| 2. Enclosure DVD Drive | 5. Active Onboard Administrator |
| 3. Standby Onboard Administrator (reserved for Future) | |



HP BladeSystem c3000 Enclosure - Rear View

- | | |
|--|---|
| 1. Local KVM interface (reserved for future) | 7. iLO/Onboard Administrator Port |
| 2. Interconnect Bay 1 | 8. iLO/Onboard Administrator Port 2 (reserved for future) |
| 3. Active Cool Fans | 9. Power Supplies |
| 4. Interconnect Bay 2 | 10. Interconnect Bay 4 |
| 5. Enclosure Up-link and Service Port | 11. Interconnect Bay 3 |
| 6. Enclosure Down-link | |

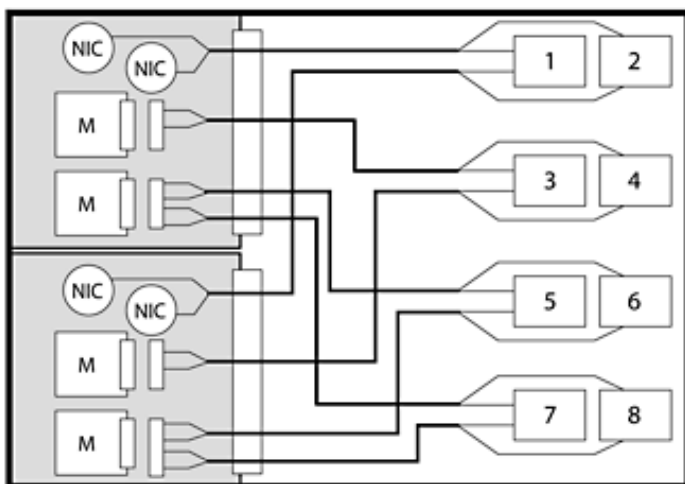
Supported Products

Mezzanines

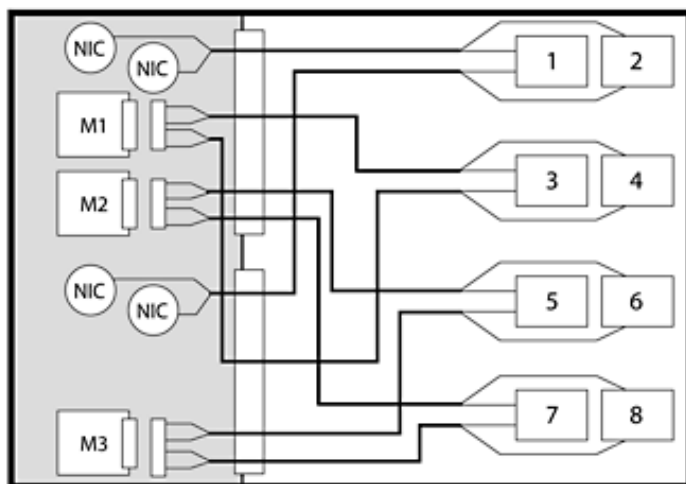
Port Mapping

Port mapping differs slightly between full height and half height server blades due to the support for additional Mezzanine cards on the full height version.

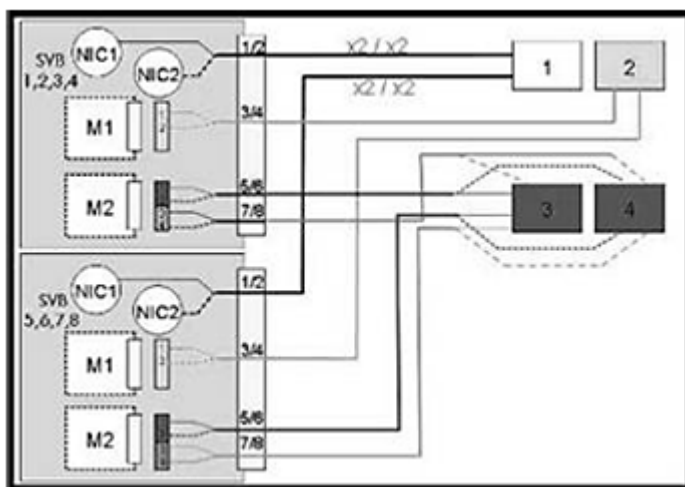
HP has simplified the processes of mapping Mezzanine ports to switch ports by providing intelligent management tools via the Onboard Administrator and HP Insight Manager Software. The Onboard Administrator Guide, Enclosure Setup and Installation Guide provides detailed information on port mapping.



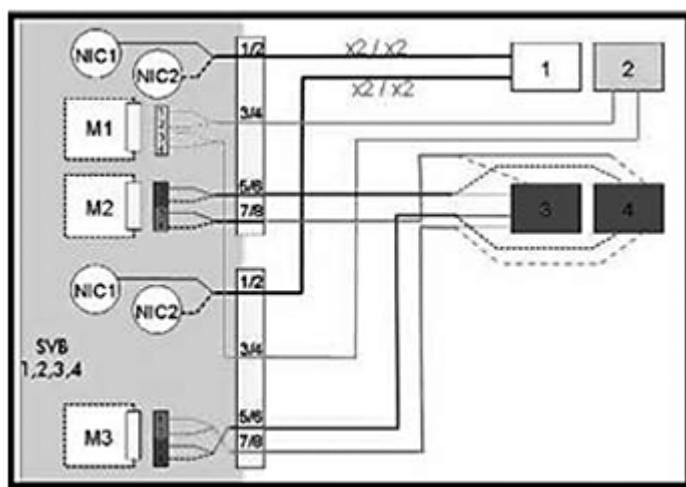
c7000 Half Height Server Blade



c7000 Full Height Server Blade



c3000 Half Height Server Blade



c3000 Full Height Server Blade

The following are supported configurations for the 1/10Gb Virtual Connect Ethernet Module. Please note that other interconnect options can be installed in the enclosure, but they do not inherit the benefits of Virtual Connect. Switches and Pass-Thru modules will operate per their default configurations. Any moves, adds, or changes to servers which are connected to non-Virtual Connect modules will require reconfiguration on the LAN and/or SAN. The Virtual Connect Manager will only manage Virtual Connect Modules.

Supported Products

HP BladeSystem c7000 Enclosure

NOTE: The following tables show a number of typical, supported configurations for an HP BladeSystem c7000 Enclosure.

[Bay 1] VC-Enet	[Bay 2] Empty
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] Empty
[Bay 3] VC-FC	[Bay 4] Empty
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] Other/empty	[Bay 6] Other/empty
[Bay 7] Other/empty	[Bay 8] Other/empty

Supported Products

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet*	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] VC-FC	[Bay 8] VC-FC

* This configuration is only applicable for enclosures with full-height servers.

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] VC-Enet	[Bay 8] VC-Enet

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Other/empty	[Bay 4] Other/empty
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC
[Bay 5] VC-FC	[Bay 6] VC-FC
[Bay 7] Empty	[Bay 8] Empty

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet
[Bay 5] VC-Enet	[Bay 6] VC-Enet
[Bay 7] VC-Enet	[Bay 8] VC-Enet

Supported Products

HP BladeSystem c3000 Enclosure

NOTE: The following tables show a number of typical, supported configurations for an HP BladeSystem c3000 Enclosure.

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] Empty	[Bay 4] Empty

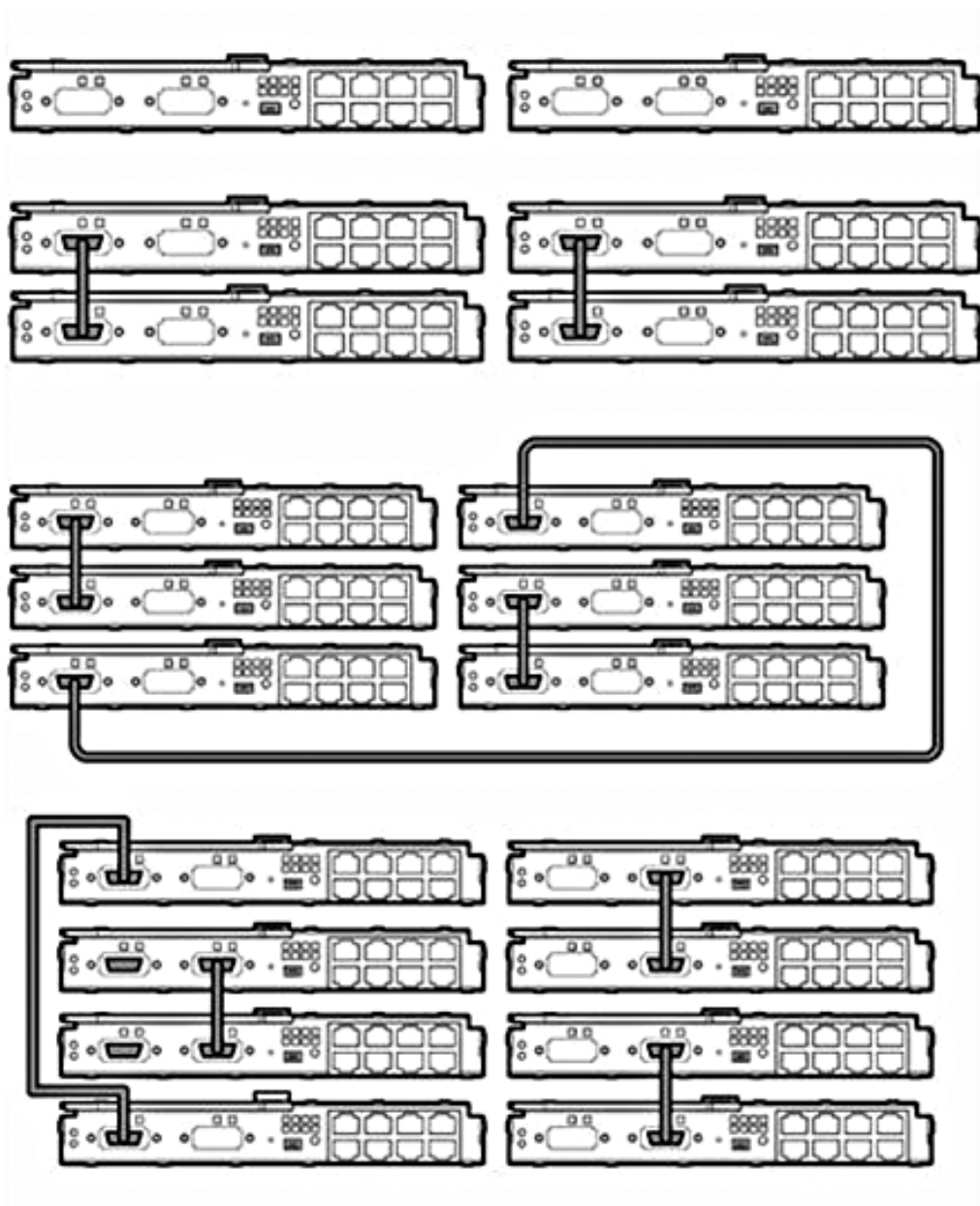
[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-Enet	[Bay 4] VC-Enet

[Bay 1] VC-Enet	[Bay 2] VC-Enet
[Bay 3] VC-FC	[Bay 4] VC-FC

Required Network Cabling	10BASE-T	Categories 3 UTP or better (up to 100 meters) EIA/TIA-568 100-ohm STP (up to 100 meters)
	100BASE-TX	Category 5 UTP or better (up to 100 meters) EIA/TIA-568 100-ohm STP (up to 100 meters)
	1000BASE-T	Category 5e UTP or better (up to 100 meters) EIA/TIA-568 100-ohm STP (up to 100 meters)
	10GBASE-CX4	Twinx CX4 (0.5 to 15m)
NOTE: For available cables; please see the "Options" section below of this QuickSpecs.		

Stacking Configuration	Stacking links are used to interconnect Virtual Connect Ethernet Modules when using more than one enclosure (future) or when using more than two Virtual Connect Ethernet Modules in a single enclosure. All Virtual Connect Modules within the VC Domain must be interconnected. Any combination of 1Gb and 10Gb cables can be used to interconnect the Virtual Connect Modules; however the following provides recommended configurations (note that a built-in 10Gb link is provided between modules in horizontally adjacent bays). Supported cable lengths on 10Gb uplinks are 3 to 15 meters and supported 10Gb stacking links (connecting between two HP Virtual Connect Ethernet Modules) are 0.5 to 7 meters. Interconnecting the modules allows all Ethernet NICs on all server blades in the Virtual Connect domain to have access to any Virtual Connect uplink port. By using these module-to-module links, a single pair of uplinks can be used as the data center network connections for the entire Virtual Connect domain, and allows any server blade to be connected to any Ethernet network.
------------------------	--

Supported Products



Service and Support, HP Care Pack and Warranty Information

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

NOTE: Server Blade Interconnect Limited Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

HP services provide total care and support expertise with committed response designed to meet your IT and business needs.

To fully capitalize on your HP BladeSystem servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a HP BladeSystem server support offer to help you speedily deploy and maximize system uptime.

Recommended Service - simplify ProLiant solution implementation, maintenance, and management.

- **Support** - 3-Year, 24x7, Same Business Day, 4-Hour response coverage
- **Deployment Service** - Installation and Start Up for HP BladeSystem Infrastructure

Enhanced Service - optimize service level to increase IT performance and availability.

- **Support** - 1-Year HP Proactive BladeSystem Service
- **Deployment Service** - Enhanced Network Installation and Start-up for HP BladeSystem Switches

Installation & Start-Up service for HP BladeSystem Infrastructure plus HP BladeSystem Enhanced Network Installation and Start-UP as per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays

For a complete listing of service offerings and information visit:

<http://www.hp.com/services/ bladesystems services>

<http://www.hp.com/go/proliant/carepack>

Related Options

Cabling Options	HP .5m 10GbE CX4 Cable	444477-B21
	HP 1m 10GbE CX4 Cable	444477-B22
	HP 3m 10GbE CX4 Cable	444477-B23
	HP 15m 10GbE CX4 Cable	444477-B27
Service and Support Offerings	NOTE: The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	Hardware Services On-site Service	UE458E
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE459E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE460E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	UE473E
	NOTE: HP Care Pack services for the c7000 and c3000 Enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 and c3000 enclosure Care Pack services.	
	NOTE: SSAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.	
	Hardware Services On-site Service	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	UE477E
	NOTE: Uplifts the Ethernet devices to the same level of service as the c-class enclosure	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE478E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE479E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE480E
	Installation & Start-up Services	
	HP BladeSystem c-Class Infrastructure Installation and Startup Service, Electronic	UE602E
	HP BladeSystem Enhanced Network Installation and Startup Service, Electronic	UE603E
	ProLiant BL c-Class Blade Server Hardware Installation, Electronic	UE493E
	ProLiant BL c-Class Enclosure and Server Blade Hardware Installation, Electronic	UE494E
	NOTE: For additional information; please visit: http://www.hp.com/services/blade-system-services	

Technical Specifications

Shipping Dimensions	Length	352.55mm (13.88 in)
	Width	270.00mm (10.63 in)
	Height	120.65mm (4.75 in)
Shipping Weight		2.0Kg (4.4lbs)
Product Specifications Hardware	Performance	108 Gb total throughput Non-blocking, line rate packet forwarding Maximum transmission unit (MTU) of up to 9216 bytes (jumbo frames)
	Connectors and Cabling	Gigabit Ethernet uplink ports (Up to 10 external) 8 external 10/100/1000BASE-T RJ-45 ports. 2 external 10GBASE-CX4 (one additional internal 10Gb Cross Connect)
	Indicators	Module locator (UID) Module status X1/X2 port status/locator X1/X2 link/port activity Port 1-8 port status/locator Port 1-8 link/activity
	Dimensions	Length 10.5in (267.7mm) Width 7.5 in (92.79mm) Height 1.1 in (27.94mm)
	Weight	1.27Kg (2.8 Lbs)
	Environmental Ranges	Temperature Range Specification 10C to 35C (50F to 95F) Temperature range* Operating 10C to 35C (50F to 95F) Shipping Shipping -40C to 60C (-40F to 140F) Storage -20°C to 60°C (-4F to 140°F) Maximum wet bulb temperature 30C (80F) Relative humidity (noncondensing)** Operating 10% to 90% Shipping 10% to 90% Storage 10% to 95%
	Power Specification	12V @ 3A (36 W)

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed. Upper operating limit is 3,048m (10,000 ft) or 70 Kpa/10.1 psia. Upper non-operating limit is 9,144 m (30,000 ft) or 30.3 KPa/4.4 psia.

** Storage maximum humidity of 95% is based on a maximum temperature of 45°C (113°F). Altitude maximum for storage corresponds to a pressure minimum of 70 KPa.

Technical Specifications

	<p>Administrator</p> <p>Each user account can be configured for a combination of four access privileges to control and/or view elements in the Virtual Connect Manager. User verification by account name and password (Case Sensitive)</p> <p>LDAP Authentication services provide role based security via an LDAP SSH Directory Server connection.</p>
Trunking and Failover Features	<p>Shared Uplink Sets using Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with upstream switches that conform to IEEE 802.3ad. Ports can alternatively be configured for failover only. External ports within a Port Set can be on the same VC Ethernet module or on multiple VC modules within the VC domain.</p> <p>In the event of an uplink failure to a data center switch, the next highest performance uplink connection or aggregation will become active.</p> <p>Fast MAC Cache failover enables rapid recovery of network connections when a standby module becomes active.</p> <p>Smart Link network senses a failed upstream switch connection and allows teamed NIC's to properly failover.</p> <p>Configure uplink speeds to Auto,,10Mb, 100Mb, 1Gb,or10Gb on the associated uplinks</p>
VLAN Features	<p>802.1Q VLAN supported on uplinks</p> <p>Uplink ports can be configured for VLAN tagging at egress or pass-thru of tagged VLAN packets from Server ports</p> <p>Native VLAN support for untagged packets on a shared uplink set. Packets can be targeted to a specific server ports.</p>
Management Features	<p>Simple and intuitive Graphical User Interface (GUI) for defining, configuring, and managing all elements of the Virtual Connect Domain.</p> <p>Setup Wizards for initial domain installation and configuration and network configuration.</p> <p>Comprehensive administration, definition, and management of Ethernet Network, Shared Uplink Set, and Server Profiles</p> <p>Embedded SNMP v1, v2 and SMI-S agents allow Network Management applications to query Virtual Connect for statistics and trap information.</p> <p>A robust, scriptable and secure Command Line Interface simplifies management and enables macros to control common Virtual Connect tasks</p> <p>Any uplink port can be used as a dedicated mirrored port for traffic analysis and troubleshooting by a Network Analyzer or Sniffer.</p> <p>Domain Management of user accounts, enclosure, Virtual Connect domain settings, and firmware updates</p> <p>The location and status of Virtual Connect Modules in the HP c-Class Enclosure and Onboard Administrator can be viewed from the Hardware Status page. Including at-a-glance detailed information of the hardware elements via mouse-over pop-up windows.</p> <p>MAC Address Administration allows local administration of predefined or user-defined MAC address ranges.</p>

Technical Specifications

VC manager runs as a high-availability pair when an HP 1/10Gb VC-Enet Module is installed in adjacent bays. All configuration data is stored in flash memory and checkpointed to the standby module. Configurations can also be backed up to a workstation via the GUI.

Management and Standards Support

Standards

IEEE 802.1Q
IEEE 802.3ac
IEEE 802.3ad (LACP)
IEEE 802.3 10BASE-T
IEEE 802.3u 100BASE-TX
IEEE 802.3ab 1000BASE-T
IEEE 802.3z 1000BASE-X
IEEE 802.3ak 10GBASE-CX4
IGMP v1, v2, v3
SNMP v.1, v.2

Safety and Compliance

Safety Certifications

UL/CUL Recognition to UL/CSA 60950-1
TUV to EN 60950-1
CB report and certificate to IEC 60950-1 with all country deviations
CE Marking

Electromagnetic Emissions Certifications FCC Part 15 Class A

FCC Part 15 Class A
EN 55022 Class A (CISPR22 Class A)
VCCI Class A
AS/NZS 3548 Class A or AS/NZS CISPR22 Class A
MIC Class A
CE Marking

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Technical Specifications

© Copyright 2008 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.